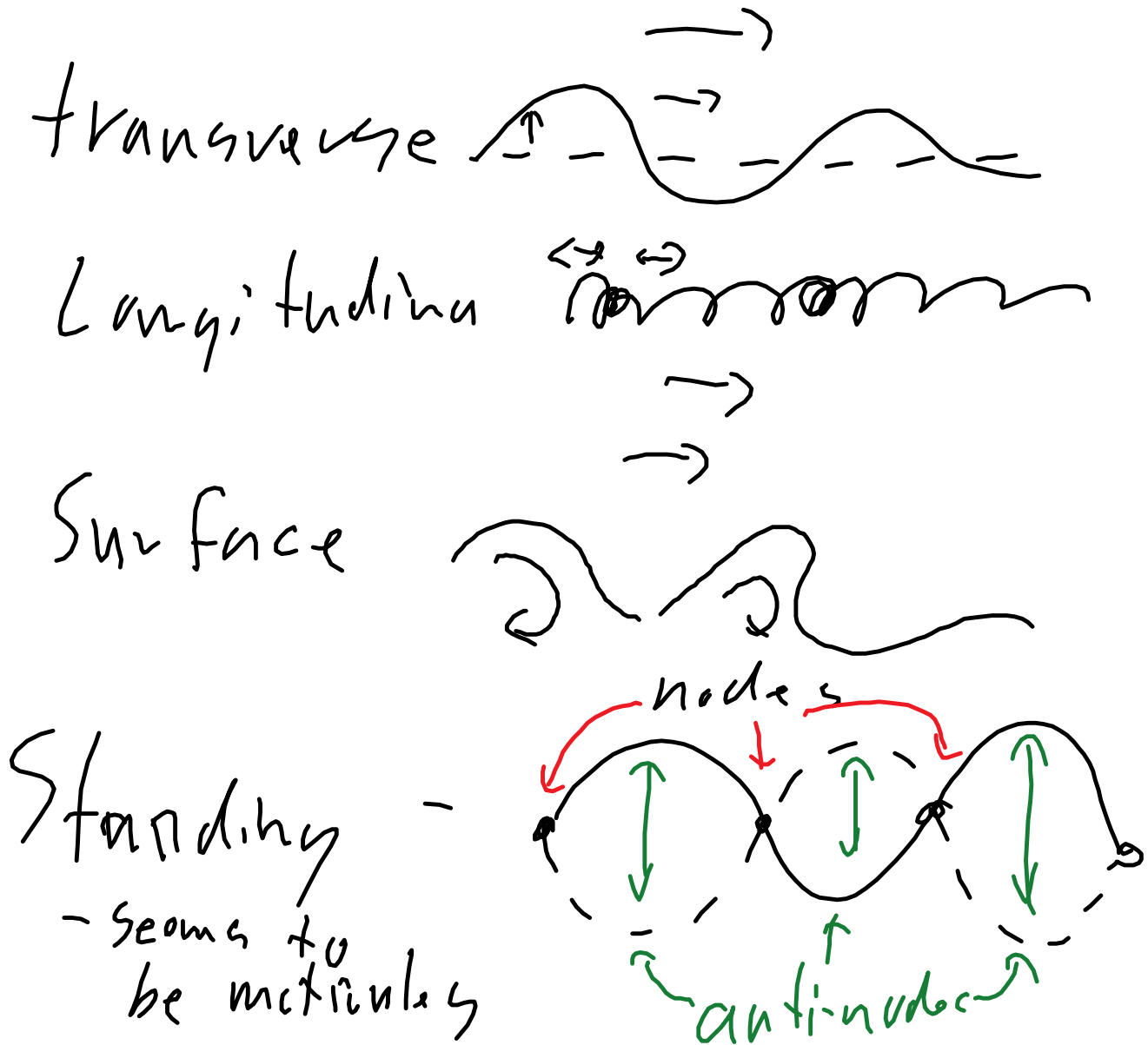


Waves and Sound Review



Standing waves are created with a continuous wave interferes with another continuous wave (often a reflected wave) of a particular frequency for the area.

- Resonance: higher amplitude waves when the frequency is just right.

speed of a wave is determined by the medium.

$$v = d/t$$

it also relates the wavelength and frequency

$$v = \lambda f$$

λ is the wavelength, the distance between successive peaks or troughs, in m.

f is the frequency, the number of events per unit time, in Hertz, $\text{Hz} = \text{cycle/s}$

$f = 1/T$ T is the period, the time between events, in s.

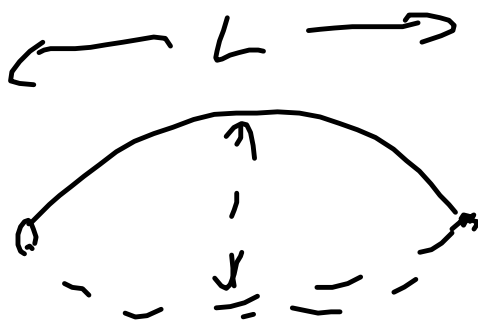
doppler shift - the frequency of a wave is changed if the source is moving or the observer is moving.

Neeeeeyaaowwwww

high pitch = higher frequency when approaching

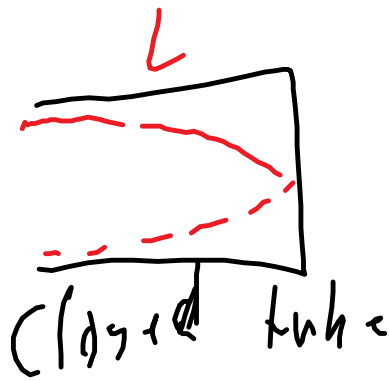
low pitch = low frequency when receding

(bonus: $f' = f(v \pm v_o)/(v \mp v_s)$ v is the speed of the wave, v_o is the speed of the observer, v_s is the speed of the source.)



$$L = \frac{\lambda}{2} = \lambda = \frac{3\lambda}{2} \dots$$

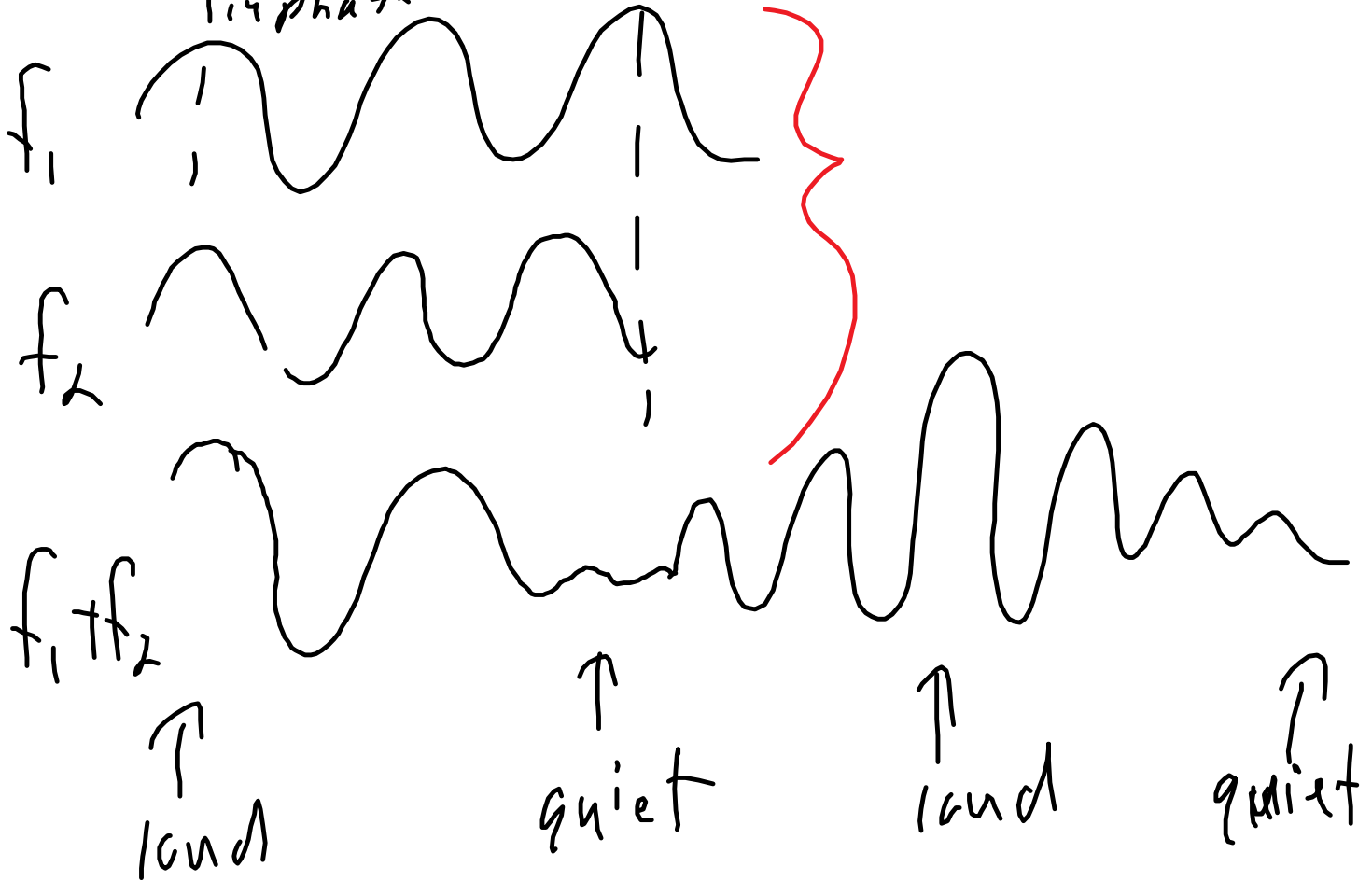
String on open tube



$$L = \frac{\lambda}{4} = \frac{3\lambda}{4} = \frac{5\lambda}{4}$$

beats
in phase

out of phase



the beat frequency is the frequency of the wah wah sound

loud-quiet part

absolute value

loud-quiet part

$$f_b = |f_2 - f_1|$$

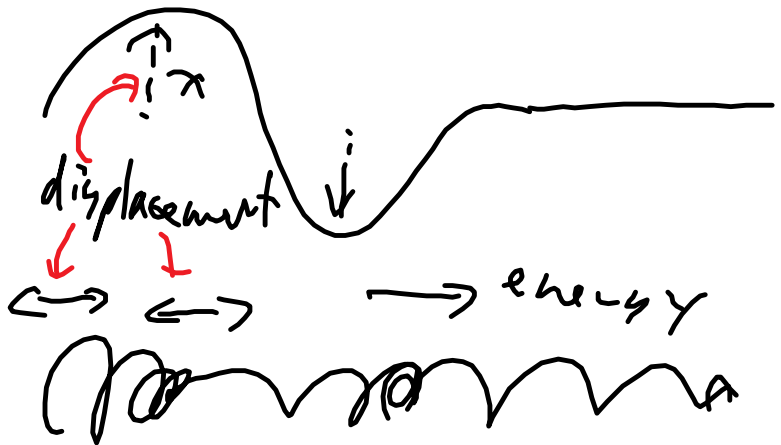
Absolute value
of the difference

Quiz Chapters 14 and 15 next class

Field trip Forms and Money
Review Waves and Sound
Quiz next class

energy →

transverse



Longitudinal



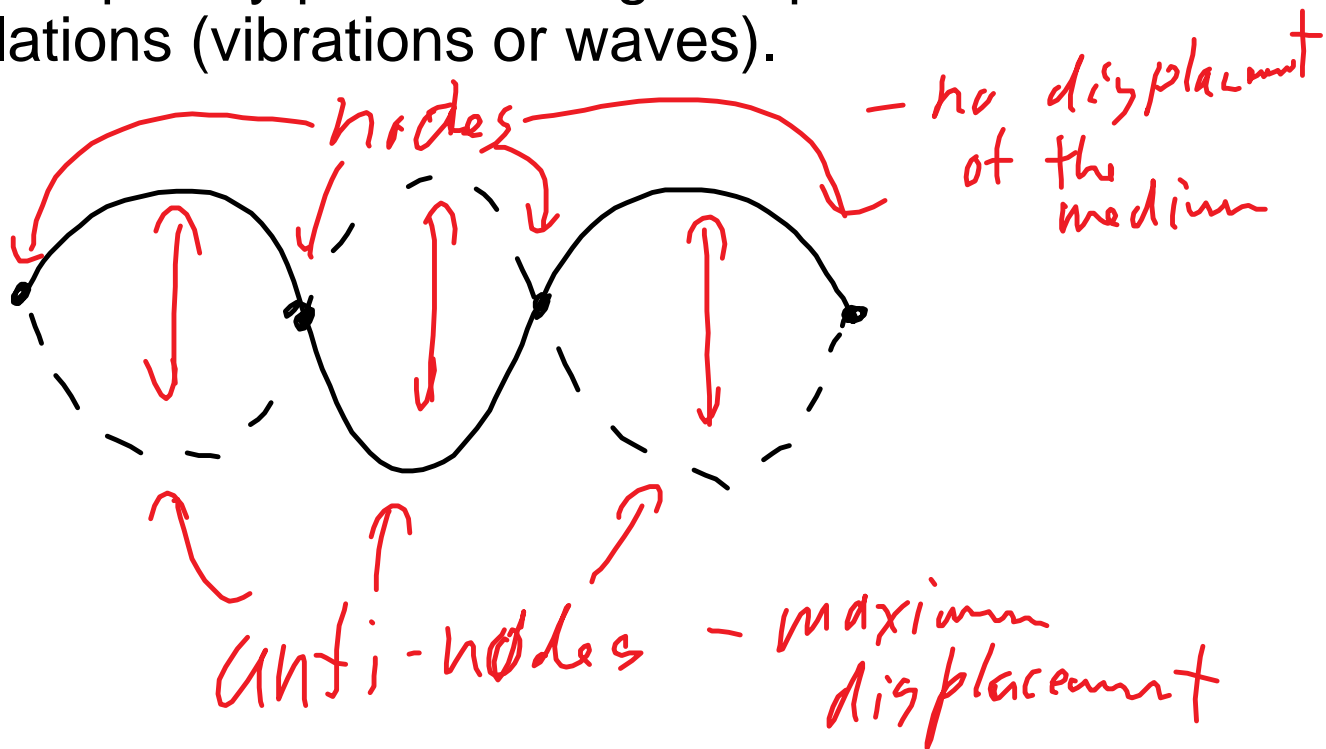
Surface waves - both



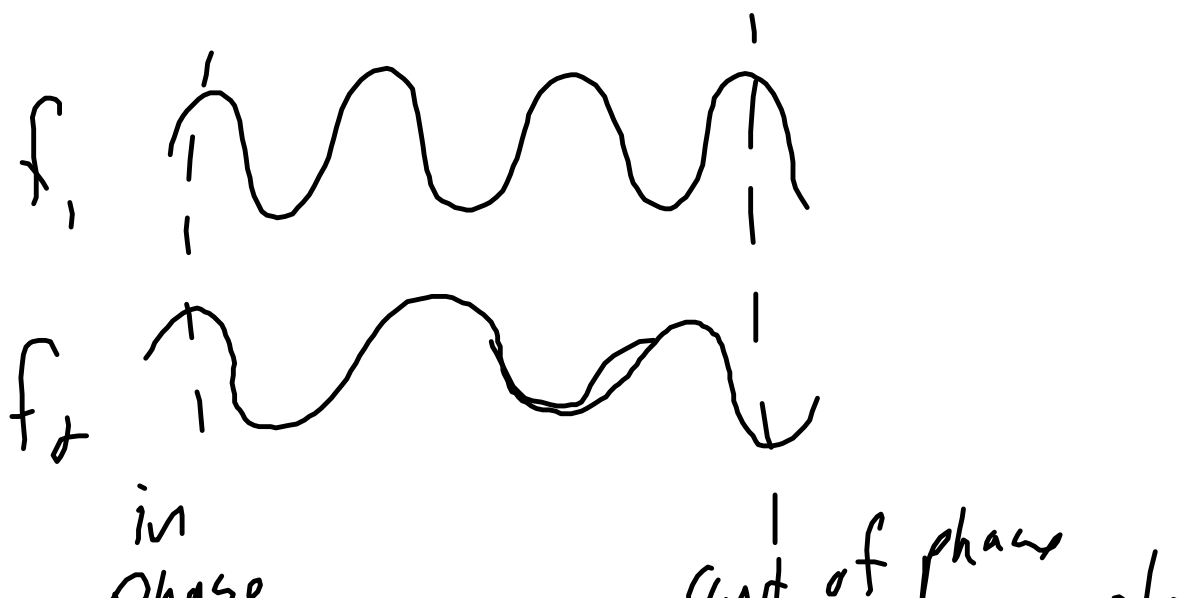
Standing waves: appear to be stationary.
Two sets of waves (often incoming and
reflected waves) interfere to produce high
amplitude waves.

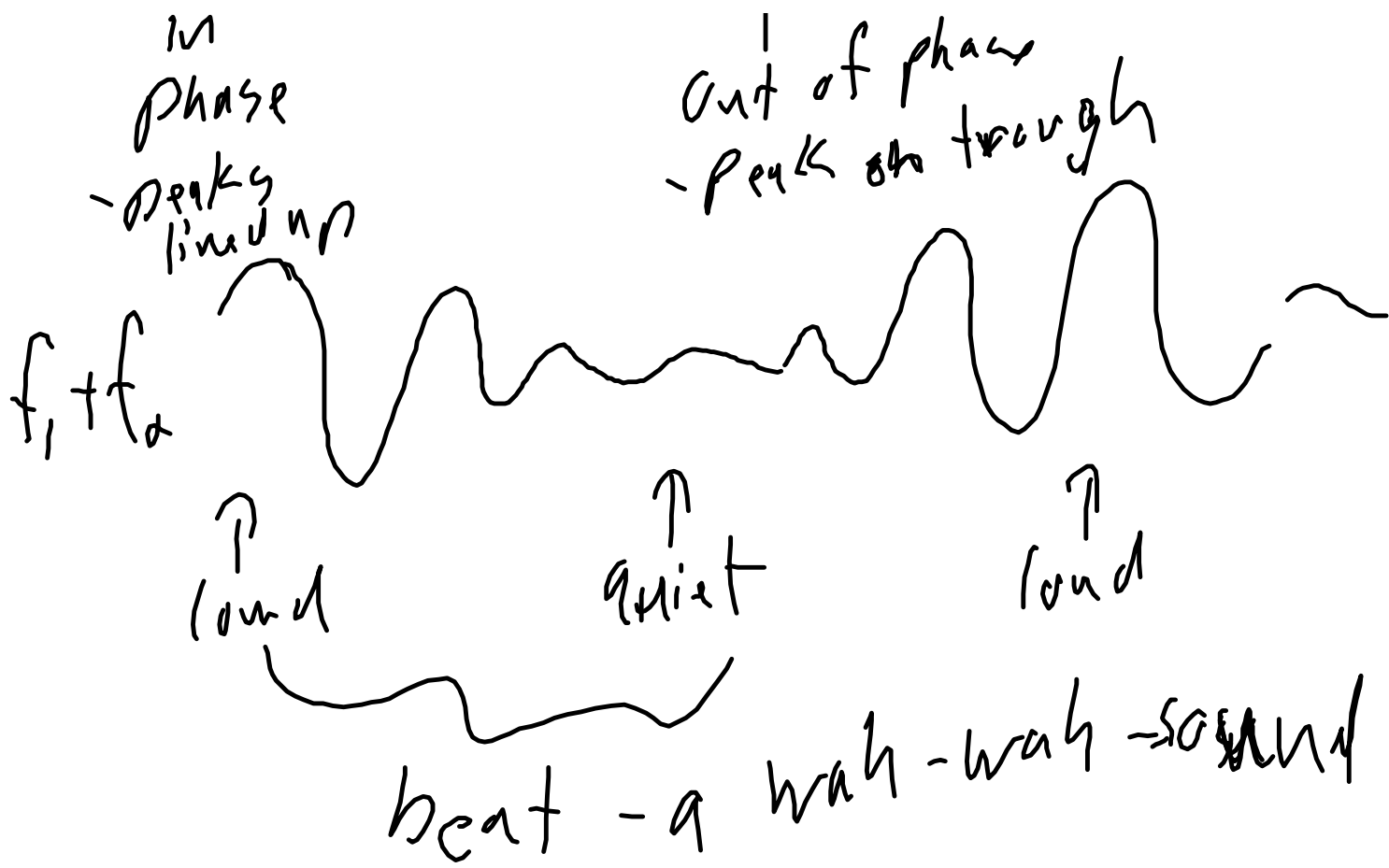
Standing waves are only produced if the frequency is just right for the medium and area.

Resonance is where an input of just the right frequency produces high amplitude oscillations (vibrations or waves).



If the 2 sets of waves are not of the same frequency, you get a more complex resulting waveform.





$$\underline{f_b = |f_2 - f_1|}$$

Absolute value
- make positive